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SUMMARY OF PUBLIC MEETINGS

ON

PRELIMINARY PLANNING ALTERNATIVES FOR SOLVING AGRICULTURAL DRAINAGE AND DRAINAGE-RELATED PROBLEMS IN THE SAN JOAQUIN VALLEY

SEPTEMBER 25 THROUGH OCTOBER 3, 1989

San Joaquin Valley Drainage Program

2800 Cottage Way, Room W-2143
Sacramento, California 95825-1898

SAN JOAQUIN VALLEY DRAINAGE PROGRAM

SUMMARY OF PUBLIC MEETINGS ON THE SJVDP PRELIMINARY PLANNING ALTERNATIVES REPORT, SEPTEMBER 25 THROUGH OCTOBER 3, 1989

BACKGROUND AND PURPOSE OF THE PROGRAM

The San Joaquin Valley Drainage Program was established in mid-1984 as a cooperative effort of the U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, U.S. Geological Survey, California Department of Fish and Game, and California Department of Water Resources. The purposes of the Program are to investigate the problems associated with the drainage of irrigated agricultural lands on the west side of the San Joaquin Valley and to formulate, evaluate, and recommend alternatives for the immediate and long-term management of those problems. The Program's goals are:

- To minimize potential health risks that may be associated with agricultural drainage water.
- To protect existing and future reasonable beneficial uses of surface and ground waters.
- To sustain productivity of existing farmlands on the west side of the valley.
- To protect, restore, and where applicable improve fish and wildlife resources.

PURPOSE AND FORMAT OF THE PUBLIC MEETINGS

The San Joaquin Valley Drainage Program's report, "Preliminary Planning Alternatives for Solving Agricultural Drainage and Drainage-Related Problems in the San Joaquin Valley," was published and distributed to the public in August 1989. The report defines problems, goals, and planning objectives for five drainage problem areas in the San Joaquin Valley. More than 70 options

and two preliminary alternatives for managing drainage and drainage-related problems are examined in the report.

During the period September 25 - October 3, 1989, the San Joaquin Valley Drainage Program (SJVDP) held public information meetings in Bakersfield, Lost Hills, Corcoran, Fresno, Mendota, Los Banos, Patterson, and Oakland, California. The purpose of these meetings was to inform concerned individuals and groups of research findings as to the source of drainage problems, and to present preliminary planning alternatives developed by the Program to resolve subsurface drainage problems and reduce adverse environmental effects associated with the production of agricultural drainage in the valley. Program staff also sought to solicit public response on the acceptability and feasibility of the preliminary alternatives, and to obtain information to be used in preparing a draft final report on alternatives for solving agricultural drainage and drainage-related problems in the San Joaquin Valley.

Members of the Citizens Advisory Committee (CAC) for the San Joaquin Valley Drainage Program hosted the public information meetings. CAC hosts opened each meeting by presenting a brief description of the Program's purpose, its research and planning activities, and the role of the Citizens Advisory Committee in representing the public interests in the planning process. At least two CAC members attended each meeting.

Deputy Program Manager Carroll Hamon presented an overview of the nature and origin of agricultural drainage and drainage-related problems in the San Joaquin Valley west-side study area. Program Manager Ed Imhoff summarized the management options and planning alternatives presented in the Preliminary Planning Alternatives report. The meeting was opened for discussion and presentation of statements by meeting participants. Participants were invited to comment on the accuracy of the Program's description of the drainage problem, the suitability of the alternatives developed, limitations of the

options presented, and any other options that should be considered. Program staff addressed questions raised by participants, and recorded statements and comments for preparation of a summary of the discussions that ensued.

The following is a summary of the audience participation at each of the meetings. The summary paraphrases principal statements and questions delivered at the meetings and responses by Program representatives. A list of meeting locations and Citizens Advisory Committee participants follows the summaries. Copies of letters that were sent to the Program as a followup to the meetings, and SJVDP responses to those letters, appear in an appendix to the summary.

MEETING NO. 1 - BAKERSFIELD

SEPTEMBER 25, 1989 - 10:00 a.m.

The first meeting was held at the Kern County Water Agency, 3200 Rio Mirada Drive, Bakersfield, California. Approximately 20 people attended the meeting, including four representatives of the news media. The following are the major issues and concerns raised by participants and responded to by Program representatives:

Statement #1a:

One of the biggest problems I've encountered over the years is the overirrigation of upslope lands. Thousands of acres of productive farmland are being salted up because of upslope overirrigation. There are a number of things that could be done to improve upslope irrigation efficiency, including drip irrigation. I realize that these are expensive options, but something will have to be done. The State Water Resources Control Board has the authority to do a lot

more about this problem if it decided to do something. The report, however, doesn't look at the State Board's role sufficiently in evaluating existing options.

Response: The Program recognizes the importance of the subject, especially to those concerned about equity and distribution of costs for managing drainage problems. We are continuing to try to define the hydrologic relationships that exist between various large parcels of land (usually several tens of thousands of acres) on the west side of the valley. We will include some useful information in the draft final report (spring 1990)--especially information showing land areas that are hydraulically interrelated by aquifer systems.

On the general nature of the condition of upslope-downslope, we have information that supports the following conclusions:

- Over a long period of time (decades or longer), large areas of the west side of the San Joaquin Valley (subareas or parts of subareas) tend to perform as regional ground-water systems. How water is applied and managed on any one farm tends to contribute to increasing or easing drainage problems within these ground-water systems.
- The dominant factor causing waterlogging is an increasing volume of water moving (vertically and horizontally) in regional ground-water systems overlying the deeply buried Corcoran Clay. Water conservation or other remedial practices on any of the lands overlying the aquifers would likely contribute to easing the regional or subregional drainage problem. However, it is difficult scientifically to attribute a specific drainage problem to an individual irrigator.

o In the short term, the volume of water applied directly on any given large parcel of land is more significant in creating local waterlogging and salinization on that particular parcel of land than is lateral flow along some particularly conductive subsurface body of material as, for example, a stringer of gravel. Stringers are buried channels of gravel that tend to be local and discontinuous in extent.

Statement #1b:

I'd just like to say that what you're doing here (conducting public information meetings) is very constructive. I'm pleased with the general approach to solving drainage problems outlined in the Preliminary Alternatives Report. It's clear that, for the time being, in-valley solutions are the only reasonable course of action. It's just too bad that the master drain wasn't constructed when that was a more feasible option.

Statement #1c:

If Central Valley Project power rates were made available to subsidize pumping water for private wetlands in Kern County (duck clubs), the cost of wetland water would be substantially reduced. This would allow wetland managers to maintain or expand the total acreage of wetlands in this part of the valley. Currently, there are no programs in place to protect these wetlands, the most endangered wetland habitat in the State. This option might also serve as mitigation for the adverse environmental impacts observed at evaporation ponds.

Response: This question is partially addressed in the U.S. Bureau of Reclamation's "Report on Refuge Water Supply Investigations, Central Valley Hydrologic Basin, California," published in March 1989. That report identifies water needs, alternative delivery systems, and power needs at ten Federal national wildlife refuges, four State of California wildlife management areas, and one privately managed wetland area. The issue of the power rate to be applied ultimately rests with Congressional legislation to be enacted by Congress.

As noted in the Preliminary Report (see pages 3-66 and 3-67), expansion of wetland areas, especially in the Tulare Basin, would be expected to benefit both aquatic birds and evaporation pond operators.

Statement #1d:

Do Program calculations include salts imported in irrigation water, as well as salts presently stored in the valley?

Response: Yes. Rather detailed estimates have been made of the salt being added annually to the semiconfined aquifer (above the Corcoran Clay and including the shallow ground water and the soil profile).

On the west side, as a whole, about 30 percent of the annual increase in dissolved salt load within the semiconfined aquifer results from major surface-water deliveries from sources such as the Sacramento-San Joaquin Delta (the Delta-Mendota Canal and the State Aqueduct). Another 20 percent of the salt load comes from the confined aquifer (below the Corcoran) as deep ground water is pumped for irrigated agriculture. And the remaining annual salt load within the semiconfined aquifer comes from the soils, through the dissolving action of applied irrigation waters.

On a subarea-by-subarea basis, however, there is considerable variation in the contribution of salts from these sources. For example, surface-water deliveries account for about 60 percent of the salt load in the Westlands Water District, but only 10 percent and 20 percent, respectively, of the salt loads in the Tulare and Kern Subareas.

Salt-budget estimates are available upon request and will be appended to the draft final report.

Statement #1e :

Why hasn't the Program studied the master drain option?

Response: Eighty-five miles of the master drain, of course, exist, but funds and agreements were never provided to extend the drain south beyond Five Points into the Tulare Basin, or north beyond Kesterson Reservoir for disposal into the San Joaquin River-Sacramento River Delta. In fact, there was never agreement on a terminus for the master drain, a facility built to remove salts from the west-side San Joaquin Valley. In present terms (1989), the environmental base of information related to extension of the master drain is largely outmoded and inadequate--especially in light of discovery of the selenium problem.

When the SJVDP began in 1984, it recognized these conditions. But it also recognized that there was an urgent necessity to discover the origin, movement, and fate of trace elements (especially selenium) in water and in affected biota and habitat. At that time, drains were being plugged and many growers expressed fear that they would lose their farms. Fish and wildlife managers were especially concerned that other "Kestersons," in fact or

potential, lurked within the valley. So, the investigative program of the SJVDP (involving millions of dollars of research) has focused in the valley, and has revealed essential and sometimes surprising information.

The availability of high-quality information in the valley (as opposed to outside the valley), and the growing belief that the toxics problem might be solvable within the valley, added administrative emphasis to looking at in-valley alternatives.

You may not be aware, however, of the effect of an incident in the year 1987 in contributing to further limitations of the SJVDP to in-valley studies. A consultant prepared a draft report "to identify possible alternative drainage-water disposal sites and to preliminarily screen and rank those sites for consideration of their potential suitability." This rather modestly funded study looked at both in-valley and out-of-valley. The unofficial release of this report was followed by an outcry of protest from local, State, and Federal elected officials representing coastal and San Francisco Bay area communities, and prompted State and Federal officials to draft restrictive legislation.

In view of all these circumstances (and also in consideration of a unanimous resolution by the State Citizens Advisory Committee), the Policy and Management Committee (PMC) of the SJVDP ordered the Program Manager to confine the remaining study (until October 1, 1990) to in-valley. In executive discussion explaining the action, the PMC noted that in-valley work was a first and essential step toward long-range solution of both the toxics and salt-balance problems, and should not be construed as forgoing ocean disposal--if such should prove necessary or desirable due to future findings; e.g., the agricultural drainage problem being shown to be unsolvable or only potentially solvable within the valley.

Statement #1f:

Why has the Program not assessed drainage problems on the east side of the valley, as well as the west side?

Response: There are several physical and policy reasons for not including drainage problems on the east side of the valley. Hydrologic and geochemical conditions on the Sierra-Nevada side of the valley generally preclude the problem of selenium in solution in the waters of the east side. Also, the problem of persistent waterlogging, as manifested by the high water tables on the west side, does not appear, generally, on the east side. Aquifers on the east side of the valley are more likely to be overdrawn than fully saturated, as on the west side of the valley. Irrigation waters and soils in some areas of the east side of the valley are deficient in elements (e.g., selenium) that are common on the west side of the valley. The Program has studied these differences and has searched for complementarities of mutual advantage in solving the two different types of problems--but so far no combinations seem feasible.

Statement #1g:

How were the study area boundaries set?

Response: The boundaries were set on the basis of a detailed analysis of existing information on cultural and natural features--especially hydrologic. Several phenomena that weighed heavily in establishing the boundaries were: the subsurface oxidation/reduction boundary that tends to mark the eastern limit of the selenium problem, water district boundaries, major ground-water quality regions, water-supply service areas, extent of waterlogged lands, and drainage practices.

Other Comments:

Following the meeting, a local city planner inquired whether the Program was considering the effects of urban conversion of agricultural lands on the drainage problem. He wondered if there might not be some potential for reducing the acreage of problem land by targeting it for urban conversion, while protecting other productive lands.

MEETING NO. 2 - LOST HILLS

SEPTEMBER 25, 1989 - 7:30 p.m.

The second meeting was held at the California Department of Water Resources Maintenance Substation located at the intersection of Highway 46 and Farnsworth in Lost Hills, California. Seven people attended the meeting. Participants in the Lost Hills meeting elected not to have a formal question and answer period after the opening presentations, but rather to engage in a free-flowing discussion of various aspects of the drainage problems and potential solutions. The following are the major issues and concerns raised by participants and responded to by Program representatives:

Statement #2a:

Couldn't drainage be discharged to the California Aqueduct and used to increase Southern California's water supply?

Response: This proposal would appear to fail several tests of feasibility.

Statement #2b:

There are a number of different drainage-water treatment research projects under way. What is the current status of these projects, and will they be continued after the Program ends?

Response: Program members confirmed that research is continuing on the removal of trace elements from subsurface agricultural drainage water. Anaerobic-bacterial treatment looks promising enough to explore further; money has recently been budgeted for construction of a pilot plant to test this procedure. Existing technology falls short of delivering an effluent that will meet the water-quality objectives of the San Joaquin River (5 ppb selenium). Most removal processes are presently too energy-intensive and too expensive.

Statement #2c:

What is the current status of evaporation ponds? What impact will State and Federal regulations and controls have on construction and operation of evaporation ponds?

Response: The current State approach in regulating evaporation ponds is to monitor contaminant concentrations in pond waters and sediments, and to attempt to minimize hazards to wildlife associated with toxic concentrations of trace elements in evaporation ponds rather than forcing irrigators to cease discharging to evaporation ponds. Program members confirmed that 3 ppm selenium in the food chain (dry weight) is a provisional safe level for birds feeding at evaporation ponds. When 4 ppm or more selenium is found in aquatic invertebrates, specific management practices, such as hazing, are required by the State to minimize bird exposure.

Statement #2d:

The Preliminary Report emphasizes drainage-water reduction goals through increased conservation. How much of the cost of conservation measures is tied in to recirculating drainage water?

Response: The SJVDP estimated the cost for the return system to be $12/acre per year, assuming a 10-percent interest rate. This is about 22 percent of the total cost of the option.

Statement #2e:

Farmers are concerned that it will be difficult to obtain low-interest loans to finance on-farm water conservation measures necessary to improve irrigation efficiency.

Response: The Program is studying incentives and disincentives that might be available or would be necessary to carry out a selected plan.

Statement #2g:

The Program should take into consideration the effects of migratory bird take in foreign countries. Waterfowl populations are declining mainly because individual hunters in Mexico are shooting as many as 50 birds per day.

Response: We have no information to either confirm or deny the allegation. The international aspects of changing migratory bird populations are beyond the scope of this study.

Statement #2h:

The slides used for the Program's presentation at this meeting are very informative. They should be included in the final report.

Response: Thank you. We will consider how to use them.

MEETING NO. 3 - CORCORAN

SEPTEMBER 26, 1989 -- 7:30 p.m.

The third meeting was held at the John Muir Junior High School, 707 Letts Avenue, Corcoran, California. Sixteen people attended the meeting. Audience participation was dominated by statements regarding institutional options outlined in the Program's Preliminary Planning Alternatives Executive Summary. Following are the major issues and concerns raised by participants and responded to by Program representatives:

Statement #3a:

The SJVDP Preliminary Alternatives Report states that significant water price increases would motivate growers to improve irrigation efficiency. This statement implies that irrigation methods are currently very inefficient. Yet the Department of Water Resources has calculated irrigation efficiency in the Tulare Lake Basin Water Storage District at about 98 percent.

Response: The Program calculates irrigation efficiency (IE) for each subarea by the following formula:

IE = total evapotranspiration - effective precipitation - upflux*/total irrigation supply - canal seepage - spills and tailwater.

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*upflux = crop use of high water table for evapotranspiration.

Program calculations are based on the best available information on the above parameters. These are usually obtained from direct measurements by the California Department of Water Resources, U.S. Bureau of Reclamation, various water districts, and specific investigators (e.g., Burt and Katen, 1987). Using this information, the Program has estimated average irrigation efficiencies for each subarea during the 1980's: Northern, 55%; Grasslands, 53%; Westlands, 70%; Tulare, 73%; and Kern, 72%. On the average, efficiencies are tending to improve and average rates may have risen slightly over the last few years. There is considerable variation in irrigation efficiencies among individual growers, depending on soil types, location of shallow water tables, type of irrigation technology, and management practices.

As pointed out in the full report, leaching fraction is not counted by the Program as a parameter in water efficiency, even though it is necessary to use up to 1 to 2 inches of water per year to leach salts from root zones. Statements of efficiency which count the leaching water as part of ET will have to add this amount to the Program's estimated efficiencies.

By any definition, however, the water-use efficiencies in the Tulare Lake Basin are probably the highest on the west side of the valley. Not by coincidence, we believe the cost of water delivered to the grower is also the highest in the Tulare Lake Basin (see page 1-19 of the SJVDP full report). We

think that these facts substantiate a strong positive correlation between water costs and water-use efficiencies--at least a sufficiently strong correlation so that this subject deserves more inquiry.

Statement #3b:

The report considers the possibility of modifying or eliminating irrigation subsidies on the cost of water delivered by the Federal Central Valley Project (CVP) and the State Water Project (SWP). Since all 30 contractors for SWP water are obligated to repay the full cost of general obligation bonds, as well as operation and maintenance costs, what is the State subsidy referred to on page 17 of the Executive Summary? Could you send me a copy of the written documentation used to develop this position?

(NOTE: Data on SWP subsidies will be mailed to the commentor. The commentor, Mr. Brent Graham, provided a written statement after the meeting. That statement is appended to this summary, along with the Program's detailed response.)

Response: We concur generally with the statement on State subsidies. You will note that Program language in the Executive Summary (top of page 17) reads: ". . ., possibly, State water supplies" (emphasis added). At this stage, subsidies are an object of investigation; more detailed information will become available in 1989 and will be included in the Program's final report. It is recognized that State subsidies, if and where they exist, are generally much less than Federal subsidies.

Statement #3c:

The report suggests using part of SWP and CVP water supplies for environmental and other uses before agriculture. However, the State Water Project already lacks sufficient water to meet its existing contractual obligations. Where would this water come from?

Response: The report lists this as an option, or possibility, to be examined in analyses under way. Consideration of contractual obligations, of course, is included in the analyses. As drainage problems continue, it is likely that irrigation efficiencies throughout the drainage problem area will increase significantly, making water available (theoretically) for other land areas and/or other uses.

Statement #3d:

Do the Program's statements on depth-to-water table (problem land) allow for the obvious rise in the shallow ground water due to spring-time preirrigation?

Response: This inquiry raises the question of how the Program calculates the extent of waterlogged land (one manifestation of a drainage problem). We use the best information available from the U.S. Geological Survey, California Department of Water Resources, and U.S. Bureau of Reclamation for 3 index years: 1977, 1982, and 1987. This represents several thousand data points over the whole west side of the valley. Measurements are taken throughout the year, at different times for different wells, to obtain the most accurate estimate of the problem. Certainly if measurements are taken during a time of the year favorable to a lower water table (as in the fall), the extent of land waterlogged might be calculated as smaller. We think that the calculations we

have made represent average conditions that reflect a land area which could experience a significant degree of salinization due to evaporative concentration of salts. Evaporative concentration of salts, and the dissolution of native soil salts, is a major problem for irrigated agriculture on the west side of the valley.

Other Comments:

There followed a short presentation by a member of the audience on the beneficial use of eucalyptus trees as biological pumps for the removal of problem water. Some 400,000 trees have been planted in the west side to date. Most are thriving and show the ability to lower the water table and intercept water coming from upslope. It should be remembered that this method still requires installation of subsurface tiles to manage the accumulation of salts in the root zone of the eucalyptus trees.

MEETING NO.4 - FRESNO

SEPTEMBER 27, 1989 -- 10:00 a.m.

The fourth meeting was held at the Fresno Convention Center, 700 M Street, Fresno, California. This meeting was attended by approximately 25 persons, including many representatives of the news media. The Fresno meeting, like the Corcoran meeting, was characterized particularly by presentations from the audience on subjects that included: (1) A statement on the history of the valley's drainage problem, and (2) Westlands Water

District's ongoing experimentations toward solving the subsurface drainage problem. Following are the major issues and concerns raised by participants and responded to by Program representatives:

Statement #4a:

I have been active in San Joaquin Valley water resource development since the 1920's. It is a mistake to separate west-side drainage problems from development of the CVP. CVP water was impounded and diverted from natural waterways that contributed to ground-water recharge, yet the CVP makes little attempt at mitigating these impacts. A lot of this CVP water is delivered to lands that were originally developed by opportunistic land speculators, and now contribute to drainage problems. Government planners fail to grasp the necessity of returning the valley to a more natural hydrological state, instead preferring to spend exorbitant sums of money on options that only cause more problems without addressing the underlying causes, e.g. deep-well injection. Other government programs to manage drainage, such as discharging it to wetlands, have been forced upon landowners, damaging their property without compensation. Now the government is gearing up to confiscate ground-water rights to manage the water shortage it created. Ground water is rightfully the private property of the landowners. The government has been negligent, incompetent, and deceitful in its development of the CVP. Planning to solve drainage problems will compound the waste and prolong the problem until water for in-stream flows for the San Joaquin River and other natural process are restored.

Response: These remarks will be considered in the remaining planning activities.

Statement #4b:

A representative of the Westlands Water District presented a brief overview of the District's efforts to solve its drainage problems. According to the presentation, the District has initiated more than a dozen projects, both independently and in cooperation with various public agencies, because it was concerned that state and federal planning would amount to too little, too late to help district growers. The official emphasized the District will continue funding and cooperating in these efforts.

Statement #4c:

How have upslope/downslope relationships been accounted for by the Program?

Response: Program members reiterated the importance of determining upslope/downslope relationships, and that research and analysis are continuing in this area (see also responses 1a, 5d, 7e, and 8g).

Statement #4d:

Is selenium or are salts the first priority problem?

Response: Selenium, as a contaminant in existing drainage-water, is the first priority problem to be solved. Increasingly, the selenium concentrations within drainage-water will dictate the method and cost of disposal. The primary impetus to drain irrigated farmland is generally related to salt

concentrations in the crop root zone. Disposal of salts are the reason for drainage, and selenium in drainage water determines how drainage will be managed.

Statement #4e:

What is the Program's stance on land retirement?

Response: Land retirement is an option now under investigation by Program staff as well as other groups. These investigations are intended to develop criteria for selecting land most appropriate for retirement and to determine the extent to which this option might contribute to solving the drainage problem.

Statement #4f:

What are the effects of air quality on crop growth? Isn't it true that eucalyptus trees consume air pollution and improve air quality?

Response: Air quality is not a discrete study element under the Program, but the Program does gather and use available information on air quality. The SJVDP is interested in both potential benefits and adverse impacts as they might relate to solving the drainage problem (e.g., possible cogeneration effects on air quality and eucalyptus effects on air quality). For general information on air quality impacts on agriculture, see "Risks, Challenges, and Opportunities," American Farmland Trust, 1989.

MEETING NO.5 - MENDOTA

SEPTEMBER 27, 1989 -- 7:30 p.m.

The fifth meeting was held at the Mendota Unified School District cafeteria, 250 South Derrick Avenue, Mendota, California. This meeting was attended by 11 persons. Following are the major issues and concerns raised by participants and responded to by Program representatives:

Statement #5a:

> There have been many severe predictions regarding loss of productive San Joaquin Valley farmland caused by drainage-related conditions, predictions which have not yet materialized. Therefore, the SJVDP's predictions in such matters should not be considered absolute. The SJVDP report assumes farmers will invest in on-farm tiles systems without guarantees of security or finalized regulatory controls. Considering the cost of drainage, there may be too much emphasis placed on this assumption. Current irrigation methods are decided by growers on a purely economic basis.

Response: The Program is attempting to forecast certain possible or likely trends, not predict the future. If certain trends continue, such as the expansion of waterlogged areas, then it is reasonable to forecast or estimate some of the likely consequences of these conditions. We agree with the commentor that the future is not absolute. But all persons involved in drainage problems need to consider future possibilities, especially conditions we might wish to avoid.

With regard to the reasonableness of the assumption that growers will invest in tiling, the Available Technologies Alternative assumes that there are no guarantees regarding regulatory controls. But no one, including the U.S. Government, will invest in drainage-control facilities without assurances of an available disposal option. Without these assurances other options which do not require on-farm tiles, such as ground-water pumping and land retirement, may prove to be advantageous in presently untiled areas. So, it may work out that the Available Technologies Alternative functions best for areas already tiled--about 133,000 acres, rather than the remainder of the 400,000 acres of drainage problem area which was assumed tiled by the year 2000. Please note that the costs of all tile installation needed for eucalyptus and saltbush are included in our cost estimates.

Statement #5b:

> There may be unanticipated adverse biological impacts caused by the eucalyptus option, which would initiate further environmental concern. Also, what is the probability of economic return from eucalyptus and saltbush?

Response: Biologists at California State University, Fresno, under contract with the SJVDP, have been studying wildlife values associated with agroforestry plantations (primarily eucalyptus) in the valley. Additionally, a small number of soil, plant, and soil samples have been collected and analyzed for more than 20 chemical elements. These data have not yet been interpreted. Additional field and laboratory research regarding the biological effects of agroforestry plantations are warranted.

Dr. Vashek Cervinka of the California Department of Food and Agriculture, a number of valley growers, and the Program are involved in various aspects of market research. Commercial potential to market agroforestry trees and shrubs is sufficient to continue studying this option. A full report will be made public during 1990.

Statement #5c:

Is the San Joaquin River reliable as a dilution and disposal point, as the report suggests?

Response: Certainly, without putting additional dilution water in the San Joaquin River, the river will not be available (lawfully) to receive and assimilate the selenium load it now receives. Also, if river water quality objectives are ever based on loads, dilution may not be effective as an option. This preliminary alternative is based on the newly established water-quality objectives for selenium (5 ppb near Newman) and on the premise that present loads will have to be reduced. In a future planning exercise we will evaluate "what if" the standard for selenium is tightened even further, "what if" additional salt standards are established for the river, and what effect the critical-year "relaxed" objective of 8 ppb selenium would have on the drainage management alternatives.

Statement #5d

Few knowledgeable observers doubt that deep-percolation from irrigation at higher elevations contributes to the amount of drainage that must be managed by nearby irrigators at lower elevations. Unfortunately there is insufficient knowledge on these hydrologic linkages to determine whose irrigation practices actually contribute

how much to drainage discharged from any particular location. A clearer understanding of upslope/downslope relationships is essential to managing drainage problems in many areas of the valley. The SJVDP Preliminary Report inadequately addresses these questions.

Response: Agreed. More work needs to be done (see also statements 1a, 4c, 7e, and 8g).

Statement #5e:

Farmers are hesitant to embrace Federal Government proposals following the closure of the promised master drain. There are also questions about the reliability of biologically based reuse systems that might be incapacitated by toxics in ground-water collected by the tile lines.

Response: Understood. We want to emphasize again, however, that the SJVDP is not advancing proposals. The Available Technologies Alternative is not a proposal, it is one of a set of alternatives that will be laid before the public in mid-1990. The Program expects that proposals will be developed after examination of the complete set of alternatives, and following public input.

The statement on toxics brings up an important point: much (but not all) drainage water contains trace elements that can become toxic. What are the consequences and trade-offs between (a) collecting these substances in tile drains and putting them into reuse and disposal systems, (b) leaving them in the soil profile or underlying shallow aquifer (land retirement), or (c) dispersing and diffusing them (ground-water pumping)? On-going analyses are addressing those questions.

Statement #5f:

The need for continued testing experiments such as Westlands' anaerobic-bacterial treatment should be addressed by the Program.

Response: Agreed. The Program is participating, through funding and staff time, in continued research in treatment.

MEETING NO. 6 - LOS BANOS

SEPTEMBER 27, 1989 -- 10:00 a.m.

Thirty-one people attended the sixth public information meeting, held at the Miller-Lux Building, 830 Sixth Street, in Los Banos, California. Following are the major issues and concerns raised by participants and responded to by Program representatives:

Statement #6a

The Grassland drainers are presently discharging through the grasslands to the San Joaquin River, but have requested permission from the Bureau of Reclamation to use the San Luis Drain. If granted, this would be beneficial to wetland users and would help restore damaged habitat. Drainage volumes would not be increased and monitoring and control of drainage would be enhanced.

Response: Agreed. The Program has prepared a technical analysis of various structural proposals for Grassland Water District, which is available upon request (Structural Options in the Grasslands Subarea, November 1988, SJVDP).

Statement #6b:

> Alternatives identified in the Preliminary Report are mainly short-term, in-valley approaches to solving drainage problems. These problems can only be managed for a short while before a long-term, out-of-valley solution must be considered to prevent the loss of large acreages of productive farmland from being forced out of production. Averting this requires long-term comprehensive planning to solve these problems without causing new and different problems.

Response: As indicated in the Preface, the Preliminary Report looks at solving the existing problem associated with toxics (primarily selenium). It recognizes the magnitude and significance of the long-term salt problem (see salt balance data in full report), but does not specifically offer solutions pointed at handling salt beyond the year 2000--although lowering shallow ground-water levels below crop root zones (if maintained) could lessen evaporative concentration and contribute to an improved salt balance in the soil. There will be, however, a continuing imbalance of salt in the semiconfined aquifer; i.e., more salt coming into the valley than is going out.

The draft final report will provide alternatives addressing both toxics and salt-related problems as far ahead as the year 2040. Determining how much of these problems can be solved in the valley is an early and essential step toward a long-term and comprehensive solution.

A lowered water table can not only eliminate waterlogging, but can also reduce the amount of salts that accumulate in the root zone through evaporative concentration. There is evidence that some growers without drainage management systems leach salts during preirrigation, only to see

salts returned to the soil profile through evaporative concentrations when the shallow water table rises into the root zone as the growing season proceeds. This condition can be ameliorated in the valley.

Statement #6c:

The long-term storage capabilities of deep-well injection should be further explored. The eucalyptus/saltbush approach seems like a reasonable option, but even this approach will leave drainage water that must be disposed of.

Response: Agreed. Westlands Water District is now exploring the deep-well option. Deep-well injection has a lot further to go than several other measures, such as on-farm water conservation; considerably more research is necessary before the feasibility of deep-well injection can be evaluated.

Statement #6d:

The Program's report does not account for impacts of poor water quality downstream due to increasing salt loads in the San Joaquin River. Since salt load in the river will naturally increase, adverse impact downstream should be expected. The report speaks of increasing the river's salt load within salinity standards, but such standards might not be in place until as late as 1993. The report does not provide information on the volume of salts currently reaching the river, nor does the report inform on how drainage disposal approaches discussed would affect this salt load, although the SJVDP has done some technical work on the subject. There are potentials for the management of salt entry into the river;

accounting for high/low riverflow periods is a crucial matter in managing the river as a disposal method. The Program should explore these matters further.

(NOTE: This commentor, Alex Hildebrand, submitted a written statement, which is appended to this summary)

Response: Program analyses under way will look at the impact of drainage-generated salts on a potential range of salt objectives for the river. In a technical report prepared by CH2M Hill (October, 1988), salt volumes were estimated; the information has been used, but not included in this report. We agree that tracking the salt load that might be generated by an alternative is essential information that must be included in the draft final report.

Statement #6e:

Proposals to increase evaporation pond acreage should be reconsidered. Wildlife protection at existing ponds is difficult and costly enough, and increasing the number of evaporation ponds may lead to public health problems. The possibility of land retirement may be the most reasonable long-term approach.

Response: The Program has made no proposals. This one alternative (in recognition of probable tight controls to make ponds bird-free or bird-safe) would reduce the present evaporation pond acreage by 50 percent.

MEETING NO. 7 - PATTERSON

SEPTEMBER 28, 1989 -- 7:30 p.m.

The seventh meeting was held at the Patterson High School, 200 North Seventh Street, Patterson, California. Seven people attended the meeting, which, like the Lost Hills meeting, was relatively informal. The central concerns expressed by participants at this meeting were to impress Program representatives with the significance of establishing drainage-related regulatory policies, the continuing need for additional research on treatment and disposal, and the importance of securing funding to implement drainage strategies. Following are the major issues and concerns raised by participants and responded to by Program representatives:

Statement #7a:

> The preliminary report does not adequately explore the thorny question of who will pay for solutions to drainage problems. The efficacy of Program alternatives will vary considerably, depending on whether costs are to be borne by individual irrigators, allocated on a regional basis, paid for from general State funds, or paid by potential beneficiaries such as fish and wildlife interests.

Response: The Program's analyses will deal with how costs might possibly be shared. We have and will continue to study various possibilities. Some of the results will appear in the draft final report.

Statement #7b:

How are evaporation ponds treated in the Program's current approach?

Response: Program members confirmed that evaporation pond acreage would hypothetically be cut about 50 percent under the Available Technologies Alternative.

Statement #7c:

The need for continued treatment experimentation, such as anaerobic-bacterial testing, should be addressed by the Program.

Response: Through staff time and funds, the Program is supporting continuing field-level research in treatment to remove selenium from subsurface drainage water.

Statement #7d:

What might an absolute time estimate for total salvage of valley farmland be? Or will large areas of farmland go out of production no matter what actions are taken?

Response: Let us separate your question into two parts: (1) How much time do we have before we lose "X" amount of irrigated land to salinization?, and (2) How much time before we lose the semiconfined aquifer for existing and potential uses? We are trying to put reasonable time lines on both conditions, under various assumptions.

Present information is insufficient to answer the land (soils) questions very precisely. Clearly, under present conditions of land and water use and management, a rate change is occurring in the valley--and it is toward

increasing loss of land due to salinization. Unfortunately, there is very little reliable, quantitative information on trends in salinization and its impact. Lacking this information, the Program has measured trends in waterlogging and water quality--indirect ways of estimating the rate of salinization. Ideally, we need both kinds of approaches. Using whatever information is available, we will estimate the sustainability of irrigated agriculture, in various water-quality zones under various possible conditions. We will also forecast the rate of degradation of the semiconfined aquifer due to a downward moving front of trace elements and salt.

The present condition under the 400,000 acres of problem land can be illustrated as follows. Due to some 20 to 40 years of deep percolation from irrigation waters, there is a zone of salty and, in places, selenium-laden ground water lying from about 5 to 150 feet (worst case) below the land surface. This zone of poor-quality water is being displaced downward by gravity and by deep-well pumping. It has been estimated that this zone is expanding downward, generally at 1 to 3 feet per year. Of course, it is continually resupplied at the top by deep percolation of irrigation water. Within the core of influence of high-capacity wells, the poor-quality water is probably moving at a much faster rate. We are studying the mechanics of this movement, looking for interpretations that will enhance our planning exercises.

Statement #7e:

> Few knowledgeable observers doubt that deep percolation from irrigation at higher elevations contributes to the amount of drainage that must be managed by nearby irrigators at lower elevations. Unfortunately there is insufficient knowledge on these hydrologic linkages to determine whose irrigation practices actually contribute

how much to the discharge at any particular location. A clearer understanding of upslope/downslope relationships is essential to managing drainage problems in many areas of the valley. The need for clarifying these relationships should be addressed by the Program.

Response: The Program recognizes that the issue of upslope/downslope is one in need of further analysis. This issue is, in fact, the most recurrent topic in valley meetings to date. There is current and pending litigation concerning farmland that appears to be adversely affected by water from neighboring farmlands. However, underground water movement is extremely difficult to forecast. Available technological means will be employed to investigate these relationships (see also statements 1a, 4c, 5d, and 8g).

Statement #7f:

The Preliminary Report is biased toward negative sanctions to induce growers to invest in on-farm water conservation. Yet positive inducements might be as effective as sanctions and, when combined with sanctions, create a better, more acceptable result. The SJVDP should expand its investigations to include consideration of the ways positive inducements might contribute to solving drainage problems.

Response: Noted and agreed.

Statement #7g:

When will San Joaquin River salinity standards be set?

Response: The only salinity objective established in the San Joaquin River above the Delta is near Vernalis (500 ppm). The Program members noted that salinity objectives for the river upstream of Vernalis (near its confluence with the Stanislaus River) were not established by the Central Valley Regional Water Quality Control Board or the State Water Resources Control Board (SWRCB) in their recent actions. The issue of the San Joaquin River salinity between its confluence with the Merced River and the Vernalis control point will probably be considered when the SWRCB resolves the outstanding issues surrounding increased riverflows and water-quality objectives to enhance anadromous fishery within the river system. SWRCB action is not expected until about 1993.

Statement #7h:

What is the possibility of returning to the master drain concept? Why is the Program centering on in-valley solutions; isn't there concern that in-valley approaches will prove inadequate?

Response: The Program's position, at this phase of study of the drainage problem, is that in-valley solutions are: (1) An essential first step to see what can be done at the origin of the problem (source control), and (2) a practical necessity due to the lack of information on the ocean environment (most research funds have been directed at the drainage problem lands and water). The in-valley investigations do not preclude future out-of-valley analyses. Instead, in-valley research and planning clarify the extent to which out-of-valley investigations and planning may be needed.

MEETING NO. 8 - OAKLAND

OCTOBER 3, 1989 -- 7:30 p.m.

The eighth and final public information meeting was held in the Oakland Museum, 1000 Oak Street, Oakland, California. The meeting was attended by 23 persons. In contrast to meetings held in the valley, audience statements reflected an overriding concern that the SJVDP give serious consideration to institutional change, development of public policies, and interregional coordination of water resources in formulating alternatives to drainage disposal problems. Following are the major issues and concerns raised by participants and responded to by Program representatives:

Statement #8a:

The SJVDP should examine east-side irrigation practices more closely for a number of reasons. Agricultural water conservation on the east side may have the potential to produce a water supply that might help meet the Program's fish and wildlife goals; water saved through conservation could be reallocated to meet Program goals. East side studies might also increase understanding of public health threats; cancer clusters discovered on the east side give an indication of how irrigated agriculture can affect domestic water supplies.

Response: The Program is studying some possibilities for moving water around to ameliorate the drainage problem, or its impact, including: improving flow characteristics in the San Joaquin River and testing the feasibility of reuse of drainage water on the east side of the valley. Based on preliminary analyses, the latter concept is not likely to result in a feasible option.

The Program is aware of the cancer clusters on the east side; but, seeing no relationship to the west-side drainage problem, it will not (and in fact has no authority to) study them.

Statement #8b:

Why is the NAS now questioning the Program's decision to examine only in-valley solutions? Does the Program pay for NAS advice and define its advisory role? What is the SJVDP's relationship to the NAS?

Response: The NAS/NRC Committee on Irrigation-Induced Water Quality Problems (CIIWQP), in a news conference on October 17, 1989, plans to release a report which takes issue with the policy action of August 1987 that limited the balance of the study (1987-90) to in-valley solutions. The CIIWQP objects to the policy action as violating the principle of comprehensiveness and obviating a potential solution that may become necessary for long-term solution of salt-imbalance problems. The SJVDP explains the decision as: (a) A necessary first step, (b) a practical step (because the research dollars have been and should be focused on the valley), (c) a good-faith step (taking care of as much of the problem as possible at the source), and (d) not precluding post-SJVDP study of ocean disposal (if in-valley won't solve the problem). Yes, the Program pays for NAS advice. By agreement of March 1985 (runs until March 31, 1990), the purpose of the CIIWQP is to review and advise (the SJVDP) with regard to the overall research strategy, review the research program in process, and assist in identifying conceptual alternatives available to deal with irrigation drainage problems. The SJVDP views the NAS/NRC as having provided valuable input to the Program, particularly in the subject areas of quality assurance/quality control for research,

investigations of nonstructural alternatives, principles for economic analyses and evaluation, and general approaches to examining and solving drainage problems.

Statement #8c:

The Preliminary Report implies that the total acreage of evaporation ponds might be reduced if water conservation methods are effective. If this occurs, some existing ponds, probably the most toxic, might be taken out of operation. The Program should determine whether retired ponds will need to be cleaned up before retirement, how this could be accomplished, how much it would cost, and how to pay for cleanup.

Response: In the full report, the Program has acknowledged the potential problem of closure of evaporation ponds, if and when closure becomes necessary. Furthermore, we have looked at some of the cost factors. To the extent that time and money are available, we will continue this work. But it must be pointed out that there has been no substantial technical work on this subject--including by the regulatory agencies. And, although Kesterson provides helpful information, other evaporation ponds are considerably unlike Kesterson.

Statement #8d:

Can the SJVDP examine reuse of drainage water more extensively? Knowledge of urban waste-water reuse greatly exceeds that of agricultural waste water.

Response: It is agreed that the technology for handling urban wastes is generally far more advanced than the emerging technology for managing agricultural wastes. The most significant opportunity for reuse of saline drainage water is to irrigate salt-tolerant trees and saltbush. We have contributed to the funding of considerable research on these reuse options.

Statement #8e:

Is the Program proposing to use freshwater to dilute drainage water prior to discharge in the San Joaquin River in order to meet State-mandated river water-quality objectives? The Preliminary Report seems to imply as much by the way discharge strategies are formulated around instream riverflows. The Program should recognize that dilution is very unlikely to provide a long-term solution to drainage problems.

Response: Once again, we are not proposing. Under this alternative, we are assuming that the capacity of the river to receive, assimilate (dilute), and transport drainage water can be used, and that such capacity might be increased by an increase of riverflow in the system as the result of providing water for a beneficial use--such as for fish and wildlife. If load standards are imposed and are unrelated to concentration in the river, then this

assumption would not be valid. Under a strict construction of the dilution principle, this assumption might not be valid. We will look at the full range of possibilities in ongoing analyses.

Statement #8f:

> Although a number of institutional changes are mentioned in the Program's report, none are accounted for in preliminary approaches. Some combination of the listed options could prove promising as part of an overall policy recommendation. The SJVDP must consider institutional changes in formulating alternatives for its final report.

Response: Correct. The SJVDP is conducting an intensive study on both existing water institutions as well as possible institutional changes related to the drainage problem. The findings, conclusions, and recommendations of that study, performed under an agreement by a nonprofit institute, will be included in the draft final report.

Statement #8g:

> There is little doubt that deep percolation from irrigation at higher elevations contributes to the amount of drainage managed by irrigators at lower elevations. Unfortunately, current institutional arrangements make it extremely difficult to implement solutions requiring cooperation between upslope and downslope irrigators. This problem is a serious obstacle in many areas of the valley and is most appropriately addressed by an institutional analysis. Will the SJVDP address this issue in its final report?

Response: We agree that this is an obstacle to implementation, and will address it in the final report (see also statements 1a, 4c, 5d, and 7e).

Statement #8h:

The Preliminary Report does not adequately examine the common assumption that the long-term salt balance problem cannot be solved without resorting to out-of-valley disposal. There appear to be several promising strategies in salt management without exportation from the valley. The SJVDP should evaluate every possibility before concurring with the common assumption.

(NOTE: the commentor, Contra Costa County Supervisor Sunne McPeak, submitted a written statement, appended to this summary)

Response: Agreed. There are possible (not necessarily feasible) ways to ameliorate the salt problem in the valley, as it is expressed in the soils and as it now affects crops: (1) Lower the water table so that there is less recirculation of salt in root zones due to the actions of dissolution and evaporative concentration (a significant part of the present problem), (2) lower the applied-water salt load deriving from pumping the deep confined aquifer, and (3) lower the salt load coming from water imported to the valley. But we must acknowledge that these in-valley options will not do much to halt degradation of the quality of water in the semiconfined aquifer--if society should choose to limit that way of disposal of salt. We are trying to develop reliable estimates of the rate of degradation of the semiconfined aquifer under varying possible future conditions. The management of salt in the soil profile is an extremely complex subject, and we really don't know much about

it. (See especially the draft ASCE Manual, "Agricultural Salinity Assessment and Management," Kenneth K. Tanji, Editor, 345 East 47th Street, New York, NY 10017.)

Statement #8i:

What will the Program do about developing additional alternatives for its final report? What kinds of alternatives are being considered, and will they be developed to about the same degree as alternatives in the Preliminary Report?

Response: (Please see attached Program response to Supervisor McPeak's letter.)

Statement #8j:

From the turn-out at tonight's meeting, I'd guess that the public information meetings are not involving all interested parties. What other ways is the Program soliciting public input to its planning process?

Response: It was noted that the public meeting had to be scheduled and announced before the baseball play-off schedule could be known. Unfortunately, this meeting is taking place at the same time as a playoff game about 5 miles away. The main ways we have been soliciting public input are through publlic discussions with organizations, solicitation of public review of major reports (this has been relatively successful), and input from representatives of various publics--as in the local planning coordination groups and in the Citizens Advisory Committee.

Other Comments:

Participants were concerned that when the Program ends in October 1990, efforts to solve drainage and drainage-related problems will falter. Since the Program's final report probably will not develop a comprehensive solution for these problems, how will the State and Federal governments meet their obligations on these issues?

Response: This has not yet been determined. Several groups, notably the Citizens Advisory committee, are addressing this. It will depend, in part, on how much the Program is able to accomplish during the next year.

SAN JOAQUIN VALLEY DRAINAGE PROGRAM
PUBLIC INFORMATION MEETINGS

SEPTEMBER 25 - OCTOBER 3, 1989

Date	Time	Location	CAC Participants
Sept. 25	10 a.m.	Kern County Water Agency 3200 Rio Mirada Drive Bakersfield	Stephen Hall Polly Smith
	7:30 p.m.	Calif. Department of Water Resources Maintenance Substation Highway 46 and Farnsworth Lost Hills	Daniel Nelson Polly Smith
Sept. 26	7:30 p.m.	Cooper Hall John Muir Junior High School 707 Letts Avenue Corcoran	Joseph Summers Don Anthrop
Sept. 27	10 a.m.	Convention Center 700 M Street Fresno	Jerald Butchert Tom Graff
	7:30 p.m.	Mendota Unified School District Cafeteria 250 South Derrick Avenue Mendota	Jerald Butchert Michael DiBartolomeis
Sept. 28	10 a.m.	Miller-Lux Building 830 Sixth Street Los Banos	Mike Stearns Jim Crenshaw
	7:30 p.m.	Patterson High School 200 North 7th Street Patterson	Clifford Koster Jim Crenshaw
Oct. 3	7:30 p.m.	Oakland Museum 1000 Oak Street Oakland	Jean Auer Chester McCorkle

Statement of
SUPERVISOR SUNNE WRIGHT McPEAK
CONTRA COSTA COUNTY
and
CHAIR, COMMITTEE FOR WATER POLICY CONSENSUS

on the

PRELIMINARY PLANNING ALTERNATIVES FOR SOLVING
DRAINAGE AND DRAINAGE-RELATED PROBLEMS
IN THE SAN JOAQUIN VALLEY

October 3, 1989
Oakland, California

Thank you for the opportunity to comment on the Preliminary Planning Alternatives for Solving Agricultural Drainage and Drainage-Related Problems in the San Joaquin Valley. This testimony is based on the ten drainage policies adopted in 1985 by the Committee for Water Policy Consensus (CWPC). These policies are attached.

The committee is composed of a broad-based and balanced group of diverse interests from the twelve county San Francisco Bay-Delta area, an area that is home to more than seven million people. This committee of private and public leaders includes elected officials, representatives from business, industry and labor, water agencies, environmental and public organizations, agricultural interests, the academic community and individuals with water resources expertise.

Most of the CWPC drainage policies are compatible with the draft, but the following comments address either conflict or suggestions for improvement.

- The Preface is premature in stating that: "The salt problem cannot be solved, over the long term, solely in the valley." That decision will be made in the future after all in-valley solutions have been exhausted.

- Management of ground water aquifers to protect water quality, particularly drinking water supplies, must be an integral part of any selected alternative.

- There must be a reconciliation of the recommendation that no additional water be imported into the valley until drainage solutions are found and, on the other hand, the current practice of continuing to develop new water supplies. A ban on future imports should be recommended, at least until a drainage program has been successfully implemented.

- CWPC Policy No. 8 states that: "Consideration may be given to reducing the problem by dilution in the near term (for a period not to exceed three years) on the condition that dilution at most be a minor component in the long-term solution of drainage problems." It is imperative that dilution not be regarded as a permanent solution. In fact, no further

detailed work should be devoted to this option. The executive summary includes the following four specific references to this concept:

1. "Pumping shallow water. In the Northern Subarea, shallow, saline ground water might be pumped into the San Joaquin River during high flows, leaving more room in the aquifer for deep percolation during the irrigation season." (page 13)

2. "Drainage-Water Disposal. Several options for drainage disposal depend on using the San Joaquin River. Drainage from Northern and Grasslands Subareas currently goes into the river. In the future, the availability of the river will depend on the salinity water-quality objectives set for the river. It is estimated that most of the Northern Subarea and almost half of the Grasslands Subarea could be drained directly into the river and still meet the objectives. . . (Under current law, dilution is not a beneficial use of fresh water.)" (page 14)

3. "Authorize use of Federal and State water to dilute agricultural drainage water so the water could meet discharge standards of, for example, the San Joaquin River." (page 17)

4. "Also, in some subareas, some drainage water would go into the San Joaquin River, to the extent that the river can assimilate it while meeting water-quality objectives." (page 18)

Additional comments that address either policy conflict or suggestions for improvement include:

- Protection of the beneficial uses of the San Joaquin River, which was called a "mess" at the recent hearing on U.S. Bureau of Reclamation activities conducted by United States Senator William Bradley in Sacramento, needs improvement. The drainage program should recommend that a parallel study program dealing with San Joaquin River issues be implemented.

- A center, easily accessible to all interested parties, should be established for all data, studies, reports and materials regarding the drainage program. It could be located at Fresno State University Research Center, at a University of California system site (Berkeley or Davis), or some other facility.

- Economic analyses need to be simplified for lay persons. As Department of Water Resources Director Kennedy stated in his testimony before Senator Bradley's hearing: "There are numbers and there are numbers!" For example, the section on page I-13, Value of Agricultural Production, uses numbers based on the sum of all private sector sales in the regional economy and involves a lot of "double counting." A more intuitively understandable figure would be regional product (similar to Gross National Product) or personal income produced. The regional product should be about thirty-five percent of the total economic impacts and personal income is usually about eighty percent of that. In other words, the question should be: What difference does it make to individual incomes?

- The statement that "Preliminary analyses indicate that significant price increases would be needed to motivate growers to change irrigation methods and management," (page 16) gives pause. Some believe that relatively small increases could be sufficient to make these changes.

- There must be an integration of water, drainage and Federal agricultural policies. That need is not made clear by the document.

- There should be an analysis of the impacts of Proposition 65 on all alternatives.

Generally speaking, there is some confusion about the alternative plans. Since there are only two in the document at this time, "The Future Without" and "Available Technologies (existing trends)," when will the remaining alternatives be ready for review? Ground water management, treatment of drainage water, land retirement and institutional changes remain as potential alternatives. Are others being examined? Will any or all of these be given the same weight as the technology alternative? Will the remaining alternatives be explained at the same level of detail?

With how many ideas and options did you start? It appears that many ideas were examined at a cursory level and then an engineering solution was chosen. Did the staff have preferences for any particular alternative? Will conservation be an integral part of every alternative?

How will the remaining alternatives be put before the public? Your schedule states that alternative plans will be presented in a draft report in mid-1990. Does that mean that there will be no public workshops on those alternatives, only written responses? Will it be possible to evaluate comments and have a final document which incorporates public response by October? That appears to be a very short turn around time.

You are to be commended for tackling this enormous responsibility and for accomplishing the vast amount of data collection and analysis to date. We hope these comments are helpful and look forward to working with you until completion of the program.

Thank you very much.

Committee for Water Policy Consensus

SAN JOAQUIN VALLEY DRAINAGE POLICIES

1. No San Joaquin Valley drain shall discharge into the Sacramento/San Joaquin Delta or San Francisco Bay system or into waters leading to the Delta until it is determined that there would be no harmful effects to beneficial uses.

2. In-valley solutions to the San Joaquin Valley agricultural drainage problem are recommended, with safeguards against contamination of groundwater aquifers. Waste water discharges must not be allowed to migrate to aquifers which are being used to supply water for drinking.

3. The solution to agricultural drainage problems in the San Joaquin Valley should include consideration of decreases in irrigation, improvements in water use efficiency, modification of agricultural practices, and reduction in irrigated acreage or utilization of unsuitable lands.

4. Additional imported waters to the San Joaquin Valley and increases in groundwater pumping which exacerbate the drainage problems should not be planned unless and until adequate agricultural waste water drainage is provided.

5. The water quality of the San Joaquin River as well as all other Delta water supplies must be protected from adverse impacts of salts and toxic pollutants entering from surface and subsurface drainage and any other sources of contamination. In any solution, beneficial uses of the San Joaquin River must be protected.

6. The State Water Resources Control Board should improve existing Sacramento River standards and promptly establish and implement San Joaquin River and south Delta quality and flow standards. Such standards would benefit both Delta and export water uses. These standards also should protect water quality and water rights throughout all river and delta channels from adverse impacts of drainage water.

7. Any solution to the San Joaquin Valley drainage problem must be part of a total management plan for the water resources of the Central Valley. Problems must not be solved for the San Joaquin Valley by transferring them elsewhere to the detriment of water quality and habitat in other areas, in particular the Delta and San Francisco Bay system and its receiving waters.

8. Consideration may be given to reducing the problem by dilution in the near term (for a period not to exceed three years) on the condition that dilution at most be a minor component in the long-term solution of drainage problems.

9. A complete library of materials on Central Valley drainage should be catalogued for general availability.

10. Local, state, and federal agencies involved with San Joaquin Valley drainage must make all relevant information available in a timely manner to the public and subject to peer review.

The "San Joaquin Valley Drainage Policies" were adopted in 1985.

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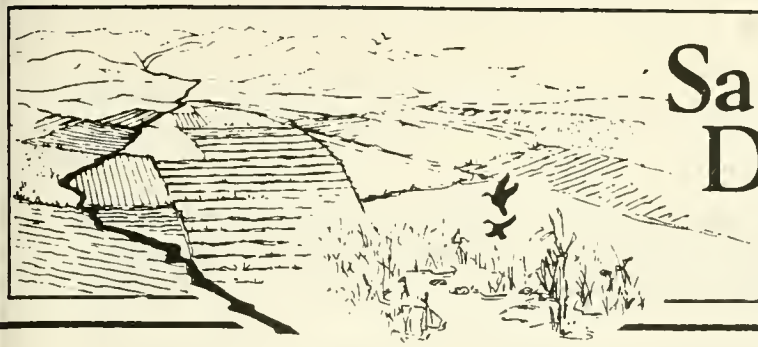

San Joaquin Valley Drainage Program

U S DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
FISH AND WILDLIFE SERVICE
GEOLOGICAL SURVEY

CALIFORNIA RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME
DEPARTMENT OF WATER RESOURCES

MP-190
PIO-2.00

OCT 2 3 1989

Sunne Wright McPeak
Supervisor, Contra Costa County, and
Chair, Committee for Water Policy Consensus
1485 Enea Court, Suite 1330
Concord CA 94520

Subject: Preliminary Planning Alternatives for Solving Agricultural Drainage and Drainage-Related Problems in the San Joaquin Valley, August 1989 (Your Letter of October 3, 1989) (Public Information Report)

Dear Supervisor McPeak:

Thank you for providing extensive and detailed comments on the "Preliminary Planning Alternatives for Solving Agricultural Drainage and Drainage-Related Problems in the San Joaquin Valley." All your comments will be carefully considered as we continue development of alternative plans to be included in the San Joaquin Valley Drainage Program (SJVDP) draft final report to be released in the spring of 1990. Thank you also for attaching a copy of the drainage policies adopted by the Committee for Water Policy Consensus (CWPC).

We are responding to several points that you have made in order to clarify the Program's position on these matters or to indicate how the Program staff plan to handle your comments.

First, you raise several issues which will require SJVDP action--probably preceded by technical analyses. In the order of appearance in your letter, these policy issues raised by you, and SJVDP-related parenthetical comments, are presented as follows:

- Management of ground-water aquifers. (Natural Heritage Institute is analyzing the legal feasibility of increasing ground-water pumping to drawdown high water tables.)

- Policy on future surface-water imports to the drainage problem area. (SJVDP staff are presently assuming total surface-water supply will remain the same.)

- Policy on dilution of water bodies as a means of increasing their capacity to assimilate agricultural drainage discharges. (SJVDP staff are now examining discharge and receiving-water relationships under a range of possible selenium and salt objectives that might be set by the State of California.)

- Designation and/or establishment of a repository for the data and information gathered under the Program. (The Policy and Management Committee (PMC) has expressed an interest in acting on this subject; analyses are under way.)

- Integration of water, drainage, and Federal agricultural policies. (SJVDP will analyze, then consider further, as appropriate.

- Impact of Proposition 65 on all alternatives. (SJVDP will analyze, then consider further, as appropriate.

Secondly, you have raised the following issues and questions that we will try to answer, from a technical stance, as follows:

- Your allegation of the prematurity of the statement in the Preface on salt balance. (On the basis of the information we present in the SJVDP report, you are correct; we plan to clarify this in the draft final report.)

- Economic analyses need to be simplified for lay persons. (The results of much-improved analyses by the Program on agricultural economics will be available for inclusion in the draft final report; we believe this will answer your questions.)

- Additional alternatives. (Some additional alternatives are being developed and will be available in the spring of 1990. Public meetings will be held again in 1990; yes, the turnaround time will be very short; all alternatives will rank equally with the two alternatives developed in the SJVDP preliminary report, and should reflect no staff preferences; the alternatives will be analyzed on a comprehensive equivalent basis; our files document a host of ideas and concepts examined and discarded, only because they (1) were physically impossible or ineffective, or (2) did not address the cause or problems of drainage.

- Will conservation be an integral part of every alternative? (Probably; the SJVDP staff have yet to make absolutely clear the importance of water conservation, in the long term, over the whole potential drainage problem area--an area about twice the present (0 to 5 feet) problem area. In the next report, we will bring in more analyses and try to write more concisely.)

We look forward to working with you and the CWPC, and to your review of the draft final report.

Sincerely,

Ed Imhoff

Edgar A. Imhoff
Program Manager

SOUTH DELTA WATER AGENCY

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September 28, 1989

Edgar A. Imhoff, Program Manager
San Joaquin Valley Drainage Program
2800 Cottage Way, Room W2143
Sacramento, CA 95825-1898

Dear Mr. Imhoff:

I am writing on behalf of the South Delta Water Agency in response to your invitation to comment on your August 1989 report on "Preliminary Planning Alternatives for Solving Agricultural Drainage Problems in the San Joaquin Valley".

The report is a useful compendium of background and drainage information. However, we are very disappointed by its failure to address, in any substantial or consistent manner, the acknowledged problem of increasing valley salt load.

The report states on pages 38 and 39 that two of the four program "goals" are to "Protect existing and future reasonable and beneficial uses of surface and ground waters from impacts associated with drainage water", and to "Sustain productivity of farmlands on the west side of the valley". The report also states on page iv and elsewhere that 3 million tons of salt accumulates each year in the valley and that "The long-term effect of not managing the salt-accumulation problem . . . . will be to severly limit the uses and value of valley lands and ground water". In other words, the stated goals can not be met without a plan for managing the salt accumulation problem. Having said this, the report then largely ignores this basic and primary problem and also ignores the downstream consequences of failing to address it.

Obviously the Program staff was limited by the unrealistic Policy Committee directive to "focus on in-valley solutions" to the problem. Salt is imported with imported water which then leaches even more salt out of westside soils. This politically motivated policy directive is, therefore, like saying that it is OK to inhale air to your lungs, but you must not exhale.

Nevertheless, the report apparently recognizes that the river has been nature's salt disposal system, that salt does go out via the river, and that large quantities of this salt can not be kept out of the river if the salt accumulation continues. The report even proposes to make some further use of this means of salt disposal. However, there is no analysis of how much salt now reaches the river, how much downstream damage that salt now causes, and how the river salt load and salinity would be affected by the options proposed in Chapter 3; including reducing drainage volume with the associated increase in drainage water salinity, using the San Luis Drain to transport drainage water to the river, applying westside drainage to eastside lands, etc.

The report does not analyze the potential for managing the time of entry of salt to the river even though your January 1989 report on "Regulating Timing of Salt Entry to the San Joaquin River" found this to be an option worthy of study. The river could dilute and flush out much more salt than is presently swept out of the valley during high flows, while maintaining low levels of downstream river water salinity. The salt load entering the river must then be substantially reduced during low flows to eliminate present and future downstream salinity damage.

The report speaks of increasing the river salt load within the limits of river salinity standards. This is a disingenuous statement because it implies the existence of river salinity standards that do not exist and which the Regional Board does not intend to establish until at least 1993. River salinity upstream of the Stanislaus has been in the 900 to 1000 ppm range for extended periods. The report also ignores the fact that even though water quality releases from New Melones have greatly exceeded anticipated levels, the river salinity at Vernalis in recent years has substantially exceeded 500 ppm for extended periods. The report, then, proposes reliance on a level of protection at Vernalis which does not exist.

The Drainage Program has tried to avoid this difficult but extremely important subject. It must have the courage to address the problem of salt load in a forthright manner. It should provide the technical information on river salt load and salinity that it has chosen to ignore. It should analyze the effect of its "options" on river salinity and explore the technical feasibility of non-damaging solutions

to the accumulation of salt. Such solutions must also recognize and operate in futherance of the Watershed Protection Statutes, the San Joaquin River Protection Statutes, and the Delta Protection Act. The Drainage Program "focused" on in-valley solutions as directed, and has demonstrated that these can not solve the problem. It is, therefore, time to stop hiding from technical realities and focus on technically feasible ways to meet the program's stated goals. The August report does not do so.

Sincerely,

Alex Hildebrand

Alex Hildebrand

AH/rdb
cc: SDWA Board of Directors

San Joaquin Valley Drainage Program

U S DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
FISH AND WILDLIFE SERVICE
GEOLOGICAL SURVEY

CALIFORNIA RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME
DEPARTMENT OF WATER RESOURCES

MP-190
PIO-2.00

OCT 2 3 1989

Mr. Alex Hildebrand
South Delta Water Agency
504 Bank of Stockton Building
311 East Main Street
Stockton CA 95202

Subject: Preliminary Planning Alternatives for Solving Agricultural Drainage and Drainage-Related Problems in the San Joaquin Valley, August 1989 (Your Letter of September 28, 1989) (Public Information Report)

Dear Mr. Hildebrand:

Thank you for your letter presenting comments of the South Delta Water Agency on the "Preliminary Planning Alternatives for Solving Agricultural Drainage and Drainage-Related Problems in the San Joaquin Valley."

As you note, in the preliminary report, the Program recognizes the probable long-term effect of not managing the salt-accumulation problem in the west-side San Joaquin Valley, but emphasizes in-valley approaches for solving the toxics (selenium) problem. You are correct in observing that the long-term salt-accumulation problem was not addressed sufficiently in the preliminary report.

We are currently working on analyses and alternative long-range plans that will address the salt-accumulation problem throughout the study area. Your comments will be utilized as we prepare the alternatives in the next few months. We look forward to working with you, and to your review of the draft long-range alternatives that will be included in the draft final report in the spring of 1990.

Sincerely,

Edgar A. Imhoff
Program Manager

2800 Cottage Way, Room W-2143, Sacramento, California, 95825-1898, (916) 978-4969

TULARE LAKE BASIN WATER STORAGE DISTRICT

ESTABLISHED 1926

1109 WHITLEY AVENUE • PHONE (209) 992-4127

CORCORAN, CALIFORNIA 93212

October 5, 1989

Edgar A. Imhoff
Program Manager
San Joaquin Valley Drainage Program
2800 Cottage Way, Room W-2143
Sacramento, California 95825-1898

Re: Preliminary Planning Alternatives - Executive Summary, August 1989

Dear Mr. Imhoff:

With reference to the public meeting on the subject report held on September 26, 1989, in Corcoran, I would like to comment on some of the options listed under the Institutional Changes, Pages 16 and 17.

Option No. 1 states, "Raise the price of water through water supply contracts. Preliminary analyses indicate that significant price increases would be needed to motivate growers to change irrigation methods in management."

This District, together with several other agricultural water districts in the San Joaquin Valley, presented considerable testimony before the State Water Resources Control Board's hearing on the San Francisco Bay - Sacramento/San Joaquin Delta in August 1987 as to the efficiency of irrigated agriculture in the San Joaquin Valley. In fact, this District is documented by the Department of Water Resources as having an irrigation efficiency of about 98%. However, the Option quoted above would have the reader believe that there is evidence to show that the farmers are not very efficient. Therefore, by artificially increasing the price of water, farmers will be more efficient and, therefore, conserve more water.

Please provide a copy of the preliminary analysis which indicates that price increases equate to greater irrigation efficiency in the San Joaquin Valley.

Option No. 3, Page 17, states, "Modify or eliminate irrigation subsidies, including those on federal and, possibly, state water supplies."

This District is one of 30 Contractors for State Project Water, exclusively agricultural water. In 1960, the voters of California approved the issuance of $1.75 Billion in general obligation bonds to fund the State Water Project. The 30 Contractors who have obligated for State Project Water are repaying the full cost, including interest, on thosebonds. In addition to the general obligation bonds, the Legislature also

provided for additional monies for construction of the State Water Project through appropriations of the Tidelands Oil Fund. These funds are also obligated to be repaid by the 30 Contractors, with interest. In addition, the 30 Contractors also repay all operation and maintenance costs as well as the cost of energy to pump the water through the State Aqueduct.

Therefore, please provide a copy of the documentation to support the statement that their is an irrigation subsidy on State Project Water.

Option No. 5 discussed "tiered water pricing" which would require changes in Federal and State law and/or policy. In the case of such pricing schemes for State Water, it would also require an amendment to each of the 30 State Water Project Contractors' Contract.

Option No. 9 states, "Authorize use of Federal and State water to dilute agricultural drainage water...."

It should be pointed out that the State Water Project currently lacks sufficient water to meet the contractual obligations of its 30 Contractors by almost 1/2. Until additional State Water conservation facilities are development, the agricultural Contractors are faced with annual shortages of their contractual amounts which, nonetheless, must be paid for.

Option No. 14 also infers a subsidy on State Project Water. I reiterate my request for such documentation.

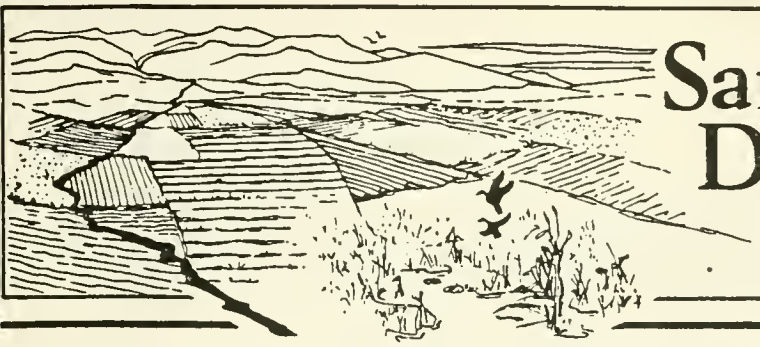
Option No. 15 states, "Authorize CVP and SWP water for environmental and other uses before agriculture." This option again totally disregards both the status of an uncompleted State Water Project and the deficiencies which are going to be imposed upon agricultural contractors the contractual provisions for State Project water. Furthermore, such option ignores the tremendous economic value of irrigated agriculture to not only the state, but also the nation.

Thank you for providing this opportunity to comment on this portion of the report.

Yours truly,

Brent L. Graham
Manager

BLG:am



San Joaquin Valley Drainage Program

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DEPARTMENT OF WATER RESOURCES

MP-190
PIO-2.00

Brent L. Graham
Manager, Tulare Lake Basin Water
Storage District
1109 Whitley Avenue
Corcoran CA 93212

Subject: Preliminary Planning Alternatives - Executive Summary, August 1989 (Your letter of October 5, 1989) (Public Information Report)

Dear Mr. Graham:

We acknowledge receipt of your letter of October 5, 1989, commenting on portions of the Executive Summary of the Drainage Program's "Preliminary Planning Alternatives for Solving Agricultural Drainage and Drainage-Related Problems in the San Joaquin Valley," August 1989, which was discussed at the Program's public meeting on September 26, 1989, in Corcoran. We are enclosing a copy of the full report, including the Executive Summary, for your information.

The first option under the category Institutional Change in the Executive Summary, which begins, "Raise the price of water through water supply contacts . . .," is more fully explained in the main report (pages 3-68 and 3-69). The text indicates that raising the price of water supplied by the Central Valley Project (CVP) or the State Water Project (SWP) on the basis of water conservation rather than cost of delivery would require fundamental shifts in Federal and State policies and probably revision to Federal and State laws. Although significantly higher agricultural water prices could lead growers to apply less water to reduce deep percolation (see the following paragraph), change crops grown, or reduce the number of acres in irrigation, the necessary increases have not been determined. The effects of water price increases on irrigation methods and management would depend on existing cultural and irrigation practices, crops grown, and soil profile conditions, among other things, and are site- or area-specific. The Program is continuing to study the effects of higher irrigation water prices on water and drainage management and will use the results, as appropriate, in the planning effort now under way.

Some general inference can be drawn about relationships between estimates of water efficiencies and cost of water to growers. The Program calculates

irrigation efficiency (IE) by the following formula: IE = total evapotranspiration - effective precipitation - upflux/total irrigation supply - canal seepage - spills and tailwater. "Upflux" is a term used for crop use of high water table through evapotranspiration.

Program calculations are based on the best available information obtainable on the above parameters, usually in the form of direct measurements from the California Department of Water Resources, U.S. Bureau of Reclamation, various water districts, and specific investigators (e.g., Burt and Katen, 1987). Using this information, the Program estimates average subarea irrigation efficiencies to be (year 1987) as follows--on the average, over the subareas: Grasslands, 53%; Westlands, 70%; Tulare, 73%; and Kern, 72%. Because growers are tending to improve efficiencies, rates may be slightly higher in the year 1989. Also, individual growers may be significantly more efficient in the use of irrigation water than the average grower. As pointed out in the full report, leaching fraction is not counted by the Program as a parameter in water efficiency, even though it is necessary to use up to 3 inches of water per year to leach salts from root zones. Those analysts who include use of water for this amount of leaching might add 7% to 10% to the above-estimated efficiencies. By any definition, however, the water-use efficiencies in the Tulare Lake Basin are probably the highest on the west side of the valley. Not by coincidence, we believe the cost of water delivered to the grower is also the highest in the Tulare Lake Basin (see page 1-19 of the SJVDP full report). We think that the facts substantiate that there is a strong positive correlation between water costs and water-use efficiencies--at least a sufficiently strong correlation so that this subject deserves more inquiry.

The main report treats the subject of irrigation subsidies on pages 3-69 and 3-70. The State of California has issued both general obligation and revenue bonds to finance construction of SWP control facilities. The rates of interest on these bonds are less than those on long-term bonds issued by private utilities, such as the Pacific Gas and Electric Company (PG&E), and it is this interest rate differential to which the State subsidy element refers. For example, it is indicated in Table 24 of Bulletin 132-88 (Management of the California State Water Project) that the percent interest cost on $100 million Series D Water System Revenue Bonds sold on June 14, 1988, was 7.668%; the interest rate on the most recent long-term bonds (due February 1, 2022) sold by PG&E in January 1989, was 9.95%. The differential means a lower interest cost for financing construction of SWP physical facilities and lower water district repayment rates. Compared to Federal subsidies on some irrigation water supplies in the valley, this State subsidy, of course, is small.

The main report addresses the subject of tiered water pricing on pages 3-70 and 3-71. The text indicates that CVP and SWP contracts with individual water districts do not contain provisions for increasing per-unit water repayment rates as water use increases, and that tiered water prices at the Federal and State levels (i.e., by the CVP or SWP) would require changes in policy and/or law. Pacheco Water District implemented a tiered water pricing structure in 1988, and Broadview Water District and Pacheco are using one in 1989. Neither district's contract with the CVP was affected by this internal pricing change. The Program is monitoring the effects of tiered water pricing in these two districts, and will continue to investigate the feasibility and effectiveness of such a pricing policy in other drainage problem areas.

While the Executive Summary does address the option of authorizing the use of CVP and SWP water for dilution of drainage before discharge, the main report covers it more thoroughly on page 3-72. Diluted drainage water would most likely discharge into the San Joaquin River and would most likely involve Federal water contractors. State water contractors with drainage problems and no natural outlet from the valley for their drainage could recycle or discharge to evaporation ponds, if they could make ponds bird-free or bird-safe. Any alternative plan positing dilution of drainage water, of course, must recognize possible institutional constraints. The State Water Resources Control Board would need to acknowledge dilution as a reasonable use, or the action of dilution would have to be accomplished as an effect secondary to the primary purpose of supplying a beneficial use; e.g.,water for fish and wildlife. This option will continue to receive further study by the Program.

Your comment regarding option No. 14 referring to the allocation of CVP and SWP water to wetlands with increased subsidy is noted.

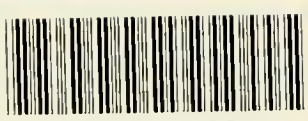
The meaning of your second sentence in the paragraph dealing with option No. 15, which begins, "This option again . . .," is unclear, and a word (or words) appears to have been omitted. This option would not remove water from agricultural use, but rather suggests altering the sequence of use in some cases. The main report notes on page 3-75 that additional physical facilities and contract modifications might be required to implement this option. It will also receive further study by the Program.

If you have any other comments or information requests, we will be happy to respond to them.

Sincerely,

Edgar A. Imhoff
Program Manager

Enclosure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